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EXAMINER

SCOTT JR, LEON

ART UNIT PAPER NUMBER

2828

DATE MAILED: 04/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/163,402

Applicant(s)

SANO ET AL.

Examiner

Leon Scott, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE filed 9/03/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10-15,17-29 and 66-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-15,17-29 and 66-79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1,2,4-8,10-15,17-29 and 66-79 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 2 of claims 1 and 20 since applicant is not allowed to claim by inference, the sealing material is missing from the claims in that it is the sealing material which allows the chamber to *sealingly store*; claims 1 and 20 express a desired result while failing to recite the structure and/or means necessary to provide that result. In line 3 of claim 1 "a discharge electrode" should read *-discharge electrodes-* and in line 3 of claims 13 and 20 "a discharging electrode" should read *-discharging electrodes-* since a single electrode is not capable of producing an electric discharge which is necessary to pump the laser gas; claims 1,13 and 20 are incomplete. In lines 6 and 7 of claim 1 and in lines 5 and 6 of claim 13, it is not clear how the output window partially reflects(claims 1 and 13) the laser light exclusive of some coating; claims 1 and 13 are indefinite and incomplete. Likewise in lines 7 and 8 of claim 20 no method step has been recited which will partially reflect the laser light exclusive of some coating; claim 20 is indefinite and incomplete. In lines 9-11 of claim 1, it is not clear if the gas is circulated through the discharge region of the electrodes and an electric discharge results ,how does the used gas return again to the discharge region; claim 1 is indefinite and

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incomplete. It is not clear in lines 13 and 14 of claims 1 and 13 how the blower is operated in accordance with a state of the electric discharging, what state; claims 1 and 13 are indefinite and incomplete. In lines 125-17 of claim 1 it is not clear how the laser can be in a condition to output light when no laser gas is excited by the electric discharge and no laser light is emitted; claim 1 is indefinite and incomplete. In line 18 of claim 13 it is not clear what constitutes an exposure state, claim 13 is indefinite, Claim 15 depends from claim 14, thus it is not clear how the operation means simultaneously stops the revolution of said blower before a start of the exposure job (claim 15) and increases a rotation speed of the blower in response to a start of an exposure job (claim 14); claim 15 is indefinite and incomplete. The recitation *the exposure device* in line 17 of claim 13 lacks a clear antecedent basis. The preamble of claim 20 recited *a semiconductor device manufacturing method* however the claim is devoid of any manufacturing method step which contains a semiconductor device, accordingly applicant is required to amend the preamble to be consistent with the steps claimed or to delete the claim; claim 20 is indefinite and incomplete. It is not clear within the context of claim language what constitutes *operation states of a laser gas* in line 5 of claim 66; further it can not be determined from the language of the claims how such states are controlled; claim 66 is functional at the point of novelty and thus is indefinite and incomplete. In line 6 of claims 66 and 73 it is not clear how the exciting means provides *laser gas non-excitement*, claims 66 and 73 are indefinite and incomplete.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a

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whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be neativied by the manner in which the invention was made.

Claims 1,2,4-8,10-13,18-29 and 66-79 are, insofar as definite, rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al('327) when considered with Larson et al('933) and Mizouchi('138) and Uemura('217).

Clark et al('327) discloses a XeCl excimer laser(see col. 5 lines 30-68 and col. 6 lines 1-8 and 54-65) comprising : a chamber for sealingly storing an excimer laser gas(see col. 4 lines 15-21, col. 9 lines 64-68 and col 10 lines 1-9), discharging electrodes for electrically exciting the laser gas(col. 10 lines 20-48); inherent in the reference is a total reflection optical element for totally reflecting laser light produced by the electrical discharge from the discharge electrodes and an output optical element for partially reflecting the laser light and for outputting a portion of the laser light amplified between the total reflecting optical element and said output optical element(see col. 4 lines 48-65, col. 5 lines 38-41, col. 12 lines 35-57 and col. 13 lines 1-30); a blower for circulating the laser gas within the chamber(see col. 10 lines 14-16), so that a laser gas passing an electrical discharge region of said discharge electrodes is circulated in said chamber an is returned to the electrical discharge region of said discharge electrodes, high pulse rate operation is achieved by virtue of high-speed recirculating gas flow between the rail electrodes. Rotating magnetic shaft seals are used for isolating the laser gas re-circulation blower from the blower motor(see abstract); and operating means for operating said blower in accordance with a state of the electrical discharge from said discharge electrodes, including a first means for operating the blower rotation and a second means for operating the blower rotation in an in-operation state in which the laser gas is excited by the electric discharge from the discharge electrodes and the laser light is being outputted(see col. 11lines 46-68 and col. '12 lines 1-11).

Larson et al('933) discloses an excimer gas laser having a blower motor with adjustable timing such that a blower fan protection circuit(1101) prevents the motors from being damaged by operating at too high of a speed, protection circuit(1101) continually compares the fan speed with a preset maximum limit, If the fan speed exceeds the preset limit, a disable signal is sent to the motor drive circuits which prevents further operation of the motors until the disable signal is removed, thus the blower rotation is in a stand-by-state in which no laser gas is excited by the electrical discharge from the discharge electrodes. The disable signal is sent for a predetermined period of time, after which the operation of the motors, and thereby the blower rotation can be reinitiated(see col. 7 lines 33-46).

Mizouchi('138) discloses: an exposure apparatus for exposing a substitute to the laser light supplied from said gas laser(see col.1 lines 25-40, col. 2 lines 16-20).

Uemura('217) discloses: an exposure apparatus for the manufacture of semiconductors which uses as an exposure light source a laser such as an excimer laser requiring gas replacement. The excimer laser generally uses mixed gas comprising three kinds of gases, i.e., halogen gas such as fluorine, inert gas such as krypton or argon, and rare gas such as helium or neon is enveloped in a laser chamber and the halogen gas and the inert gas react to cause a discharge in the chamber to thereby emit laser light(see abstract, col.1 lines 47-52).

Given the structure of the references it would be obvious that one of ordinary skill in the art: a) desiring to adjustably control the blower gas circulation means of an excimer laser would be motivated to substitute the blower and motor controls disclosed in Larson et al('933) for those in Clark et al('327) since both blowers are used to circulate the gas in the chamber between the discharge electrodes; and b) desiring to use the excimer laser of the above disclosed reference combination in an exposure apparatus to expose a substrate to the excimer laser light would be motivated to substitute the excimer laser of the reference combination for the excimer laser of Mizouchi('138)

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since depending upon the desired result or intended use it is well known to substitute one excimer laser for another; applicants' device is obvious. As to claim 20 it is clear that the structure of the reference combination will *inherently* produce the steps of the method; applicants' device is obvious. As to the diminished Markush groups of claims 21-29, it is clear that all the claimed excimers are encompassed by the disclosure of Uemura('217) and one of ordinary skill in the art desiring to use a particular excimer laser having a specific line would be motivated to substitute any of the excimer gases of Uemura('217) into the reference combination; applicants' device is obvious. It is pointed out to applicants that since a laser resonator is defined by a pair of optical elements , one optical element being partially reflecting and the other optical element being total reflecting; the structure of claims 70-73 and 77-79 is inherent in the reference even if the above disclosure to the resonant cavity were non existent; applicants' device is obvious.

Nakuma et al is cited for its teaching of an exposure apparatus using excimer lasers.

JP 10097986A document is cited for its teaching of an exposure system using a krypton fluorine excimer laser.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Scott, Jr. whose telephone number is 703-308-4884. The examiner can normally be reached on Monday - Friday, 6:30am - 5:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul P. Ip can be

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reached on (703)308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7721 for regular communications and 703-308-2864 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.


Leon Scott, Jr.
Primary Examiner
Leon Scott, Jr.
Primary Examiner
Art Unit 2828

lsjr
April 3, 2003